

NON-PUBLIC?: N
ACCESSION #: 8906290110
LICENSEE EVENT REPORT (LER)

FACILITY NAME: OYSTER CREEK, UNIT 1 PAGE: 1 OF 5

DOCKET NUMBER: 05000219

TITLE: MAIN GENERATOR TRIP CAUSES AUTOMATIC REACTOR SHUTDOWN
DUE TO PERSONNEL
ERROR

EVENT DATE: 05/18/89 LER #: 89-015-00 REPORT DATE: 06/19/89

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: P. Cervenka, Plant Engineering TELEPHONE: 609-971-4894

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On May 18, 1989 at 1103 hours the reactor automatically shut down due to a trip of the main turbine generator. An instrument technician had been assigned the task of calibrating the plant megavar recorder. He discussed the activity with shift management but did not mention that input leads to the recorder would be disconnected. The technician started the evolution an hour and a half later without informing the Control Room. Upon disconnecting the input leads to the recorder, a Hi/Low VAR alarm was received. The operators did not realize that the alarm was the result of the technician's work and attempted to manually restore the VAR loading. The operator did not realize that he was actually increasing megavars because he was not observing bus voltages, which were increasing. A generator overexcitation condition resulted which tripped the main generator, caused a reactor scram, and resulted in a fast start of both diesel generators. The operators proceeded to cooldown the plant with the Isolation Condensers until the Shutdown Cooling System was placed into service at 1523 hours. The plant reached cold shutdown

conditions at approximately 1700 hours. The root cause of this event was personnel error on the part of both operations and maintenance personnel. To prevent a recurrence of a similar event, administrative controls have been implemented and increased emphasis has been placed on communications between the work group and the control room. Operators will be briefed on the need to use all available indications during a response to an abnormal condition to avoid a recurrence of this event.

END OF ABSTRACT

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DATE OF OCCURRENCE

The event occurred on May 18, 1989 at 1103 hours.

IDENTIFICATION OF OCCURRENCE

On May 18, 1989 at 1103 hours the reactor automatically shut down due to a trip of the main turbine generator (EHS code EL). This event is reportable in accordance with 10CFR50.73(A)(2)(iv).

CONDITIONS PRIOR TO OCCURRENCE

The reactor was at 99.7% full power, with a generator load of 650 megawatts electric.

DESCRIPTION OF OCCURRENCE

At the beginning of the day shift on May 18, 1989, an instrument technician was assigned the task of calibrating the plant megavar recorder (EHS Code CFI-ER). Prior to commencing the work, the technician reviewed the vendor manual and the equipment history card. He determined that to perform the calibration he would have to disconnect the input leads to the recorder. He discussed the activity with the Group Shift Supervisor (GSS) and then with the Lead Control Room Operator (LCRO) but did not mention that input leads to the recorder would be disconnected. Both the GSS and the LCRO left the discussions with the understanding that only the recorder and not the front panel meter would be affected by the calibration.

Approximately one and a half hours later (1101 hours), the technician began the calibration procedure without informing the Lead Control Room Operator. When the input lead to the recorder was disconnected, the control room annunciator for High/Low VARS was received and the megavar meter on the front panel went to the full downscale position. Another control room operator, who was out of the control room when the technician discussed the

evolution with the LCRO, responded to the annunciator. After noting that the megavar meter was downscale he checked other indications, and confirmed all other parameters looked normal. This operator then proceeded to the rear of the panel to check the recorder reading. He did not notice the technician at the rear of the recorder and sounded out to the LCRO that the recorder was reading 0 VARS. The LCRO then checked the meter on the front panel which was

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still reading 0 VARS, took manual voltage control of the main generator field, and started to raise megavars by adjusting the manual rheostat. The operator did not realize that he was actually increasing megavars because he was waiting for a response on the megavar meter and was not observing bus voltages, which were increasing. A generator overexcitation alarm was received at 1103 hours as a result of the condition. The GSS then noticed the increased voltage on the plant buses and directed the LCRO to reduce the voltage by lowering the manual rheostat. Although the circuit breaker trip logic contained a time delay, the voltage could not be reduced quickly enough to prevent a trip of the main and field breakers associated with the generator. When these breakers tripped open at 1103 hours, the acceleration relay in the turbine control logic actuated, causing the control valves to rapidly close which generated a reactor scram signal. The operators confirmed the reactor was shutdown. The rapid closure of the turbine control valves caused a pressure spike to 1077 psig which caused an automatic trip of all Recirculation Pumps (EIIS Code AD), lifting of two Electromatic Relief Valves (EIIS Code RV), and actuation of the Isolation Condensers (EIIS Code BL). The operators manually isolated the reactor vessel and controlled reactor pressure with the Isolation Condensers. Reactor level reached a low point of 98 inches above the top of active fuel (TAF) at which time a feedwater pump (EIIS Code P) was started to restore level to the normal operating band. At 1123 hours the operators stabilized level and pressure and continued to cool down the plant with the isolation condensers.

When the main generator output breakers tripped on an overexcitation condition, the main output and generator field breakers trip by design, but the generator lockout relay (86G) does not actuate. Therefore, the breakers between the main generator and the in-plant 4160 volt buses did not open and the plant's electrical distribution did not swap over to the startup transformers. This resulted in a low voltage condition on the plant's vital buses causing these buses to isolate which caused a fast start of both diesel generators. The diesel generators assumed and maintained load on the vital buses. The main generator continued to supply power to the non-vital buses while coasting down until an operator manually opened the plant's supply breakers. This caused the startup supply breakers to close in automatically, which restored normal offsite power to the plant electrical distribution system and allowed a feedwater pump to be started. As a result of the

electrical power perturbations, the plant's normal ventilation system tripped and operators started the Standby Gas Treatment System to maintain Secondary Containment integrity. At approximately 1157, while restoring the electrical distribution system to normal, two full scrams were received as designed. The Shutdown Cooling System was placed into service at 1523 hours and the plant reached cold shutdown conditions at approximately 1700 hours.

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APPARENT CAUSE OF OCCURRENCE

The root cause of this event has been determined to be personnel error on the part of both operations and maintenance personnel involved. There was a lack of control over the maintenance activity in that the instrument technician did not identify all the effects associated with the lifting of the recorder input leads and did not inform the operators when he was ready to start the job. This challenged the operators to respond to an alarm which they believed was real.

The operators did not review all available indications prior to and during the response to the annunciator. If the operators had checked other indications, prior to taking action or during the course of action, this event could have been prevented.

ANALYSIS OF OCCURRENCE AND SAFETY ASSESSMENT

The Post Transient Review Group was convened to review this occurrence due to the complex sequence of events which occurred over a short period of time. The review determined that the plant responded as designed and operator response to the event was appropriate with the exception of a cool down rate which exceeded station guidelines but not Technical Specification limits. This event was an unnecessary challenge to operators and equipment, but was within the design basis of the plant. It was however, a significant transient in that several engineered safety features were actuated, including the diesel generators which were called and relied upon to provide power to the plant's vital buses.

CORRECTIVE ACTION

The overexcitation of the main generator caused an over-voltage condition on the plant's buses. This condition was evaluated and determined not to have adverse effects on plant equipment.

To prevent a recurrence of a similar event the following corrective actions were taken:

- Administrative controls were implemented to ensure a more thorough and consistent review of temporary variations, such as lifting leads, in all the various types of maintenance activities.

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- Procedural requirements were revised to increase emphasis on communications between the work group and the control room immediately prior to the start of a work activity.

In addition to the above, appropriate maintenance and operations personnel were briefed on the specifics of this event with emphasis on communications, reviewing temporary variations for a full understanding of effects prior to starting a work activity, and the need for operators to use all available indications prior to and during a response to an abnormal condition.

SIMILAR OCCURRENCES

LER 86-032 - Reactor Trip on High Neutron Flux Caused By Cold Feedwater Addition Due to Operator Error

ATTACHMENT 1 TO 8906290110 PAGE 1 OF 1

Nuclear GPU Nuclear Corporation
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609 971-4000
Writer's Direct Dial Number:

June 19, 1989

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Dear Sir:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Licensee Event Report

This letter
forwards one (1) copy of Licensee Event Report (LER) No. 89-015.

Very truly yours,

E. E. Fitzpatrick
Vice President & Director
Oyster Creek

EEF: JJR: dmd
(0705A:01)
Enclosures

cc: Mr. William T. Russell, Administrator
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